Application Of Achievability Control Theory To Hybrid Multi-Agent Systems, Phase I

Completed Technology Project (2004 - 2004)

Project Introduction

The objective of the proposed project is the development of technology for more efficient and effective human-computer supervision of complex systems. Systems that combine humans and automation in a synergistic or cooperative manner may be termed hybrid systems. Hybrid systems offer advantages over both purely automated systems and purely manual systems in many circumstances. However, future hybrid systems will be even more complex than contemporary ones. This gives rise to a serious need to develop methods for integrating humans more closely?and more efficiently?than is possible now within hybrid systems. We propose to apply a recent Raven Research innovation, Achievability Control Theory (ACT) to the problem of integrating multi-agent autonomous and semi-autonomous systems into human-machine teams. ACT is a superset of Supervisory Control Theory (SCT) which more synergistically combines human and machine capabilities and enhances the flexibility and effectiveness of hybrid robotic and automated systems. This approach allows for integration of multiple agents in a system and at same time promotes human-centric understanding and design of such a system.

Primary U.S. Work Locations and Key Partners

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Organizations Performing Work	Role	Type	Location
⭐Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Raven Research Corporation	Supporting Organization	Industry	Lenoir City, Tennessee

Primary U.S. Work Locations	
California	Tennessee

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

John V Draper

Technology Areas

Primary:

- TX04 Robotic Systems
  └ TX04.4 Human-Robot Interaction
    └ TX04.4.2 Distributed Collaboration and Coordination